Docket No.: W003-4000 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: WOOLFORK, C. Earl.	:	
Serial No. 10/648,012	:	Group Art Unit: 2615
Confirmation No.: 3337	:	Examiner: Flanders, Andrew
Filed: August 26, 2003	:	
For: WIRELESS DIGITAL AUDIO SYSTEM	:	

APPEAL BRIEF IN COMPLIANCE WITH 37 CFR § 41.37

Attention: Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The Appellant respectfully submits this Appeal Brief pursuant to 37 C.F.R. §41.37, in support of the Notice of Appeal filed October 22, 2007[1]. The required fee under 37 C.F.R. § 41.20(b)(2) is submitted herewith. This Appeal is filed to appeal the rejections of Claims 19-34, 37, 38, and 41-59 set forth in the Final Office Action ("FOA") mailed July 23, 2007.

This Appeal Brief is being submitted within two (2) months of the October 22, 2007 filing date of the Notice of Appeal. In compliance with 37 CFR § 41.37, this Appeal Brief has the following sections, as identified in the Table of Contents below.

[1] Appellant's Petition to Make Special under 37 CFR Section 1.102(d) and MPEP Section 708.02, SECTION II (Infringement) was granted by the Director on January 25, 2005.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest is C. Earl Woolfork.

II. RELATED APPEALS AND INTERFERENCES

There are currently no other appeals or interferences of which Appellant or Appellant's legal representative are aware, that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

The following is the status of all of the claims:

(a) Claims 1-18, 35-36 and 39-40 are cancelled.

(b) Claims 19-34, 37, 38 and 41-59 stand rejected and are being appealed.

IV. STATUS OF AMENDMENTS

No amendments to the Claims subsequent to the Final Office Action mailed July 23, 2007 have been filed by the Appellant.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's invention is generally directed to a wireless digital audio system 10 for coded digital transmission of an analog audio signal from any music audio player with an analog headphone jack 82 to a receiver headphone located away from the audio player. Fuzzy logic technology may be utilized by the wireless digital audio music system to enhance bit detection. A battery-powered transmitter 20 may include a headphone plug 22 in communication with any suitable music audio source 80. For reception, a battery-powered headphone receiver 50 may use embedded fuzzy logic to enhance user code bit detection. Fuzzy logic detection may be used to enhance user code bit detection during decoding of the transmitted audio signal. The wireless digital audio music system provides private listening without interference from other users or wireless devices and without the use of conventional cable connections.

Independent Claims 19 and 43 are directed to a wireless digital audio system 10 for transmitting audio from at least one audio source wirelessly via at least one digital audio transmitter 20 to at least one receiver 50, wherein the receiver 50 is a headphone receiver (See paragraph [0009], and FIG. 1, of the Instant Application[2], and paragraph [0011] of Parent Application[3]).

[2] Unless reference to the paragraph is made specifically to the Parent Application, all paragraph numbers and Figure numbers relate to the Instant Application. Instant Application is the CIP Application that was filed on August 26, 2003, application no. 10/648,012 and subsequent amendment entered thereafter during the prosecution. CIP Application claimed priority from the Parent Application that was filed on December 21, 2001.

[3] Parent Application refers to the application filed by the same inventor on December 21, 2001, application no. 10/027,391 and published on June 26, 2003, Publication No. US 2003/0118196 A1.

With reference to FIG. 2 and paragraph [0009], the transmitter 20 includes a first analog low pass filter 30 receiving the audio output, a digital low pass filter 34, an analog-to-digital converter (ADC) 32 operatively coupled between the first analog low pass filter and the digital low pass filter, a first encoder 36 receiving output from the digital low pass filter 34 and being configured to reduce intersymbol interference (ISI), a second channel encoder 38 operatively coupled to the first encoder 36 and adapted to reduce transmission errors, a digital modulator 42 operatively coupled to the second channel encoder 38, and a differential phase shift key (DPSK) module 48 for transmitting a corresponding DSSS signal having said audio output representative of the music and the unique user code bit sequence (paragraph [0014] of the Parent Application).

With reference to FIG. 3 and paragraph [0010], the receiver 50 includes a band pass filter (BPF) 54 configured to process the transmitted DSSS signal, a direct conversion module 56, a digital demodulator 62 adapted to process an output from the direct conversion module 56, a Viterbi decoder 66 coupled to the digital demodulator 62 and for generating a corresponding digital output. The receiver 50 further includes a source decoder 68 for processing the digital output from the Viterbi decoder 66. The receiver 50 further includes a second analog low pass filter 72, and a digital-to-analog converter (DAC) 70 operatively coupled between the source decoder 68 and the second analog low pass filter 72. The second analog low pass filter 72 generates the audio output representative of the music. The music is reproduced if the unique code bit

sequence is recognized, in order to provide the user with private audio reproduction of the music without interference from other users or wireless devices.

Independent Claim 30 also relates to a wireless digital audio system 10. Claim 30 includes limitations of Claim 19 and further includes at least one module (amplifier 74) to amplify the audio output generated by second analog low pass filter 72. Claim 30 further relates to a limitation directed to a receiver 50 that utilizes embedded fuzzy logic to enhance detection of the unique user code. A fuzzy logic detection sub-system 61 is described in detail in paragraphs [0013, 0014, and 0015] and depicted in FIG. 1.

Independent Claim 33 also relates to a wireless digital audio system 10, which includes at least one audio source 80, at least one digital audio transmitter 20 coupled to at least one audio source 80, and at least one audio receiver 50. The audio transmitter 20 and receiver 50 are configured for code division multiple access (CDMA) communication. (See paragraph [0009] and FIG. 1) The system 10 further includes at least one module adapted to audibly reproduce the processed CDMA signal. The system 10 provides a user with independent audio reproduction free of interference from other users or wireless devices. (See paragraphs [0005] and [0011])

Independent Claim 34 also relates to a wireless digital audio system 10. In addition to the limitations recited in Claim 33, Claim 34 also includes at least one module (amplifier 74) to amplify the processed CDMA signal generated.

Independent Claim 44 also relates to a wireless digital audio system 10. Claim 44 contains similar limitations as Claim 19. However, in Claim 44, if the unique user

code is recognized, the audio output is reproduced, the audio output having been wirelessly transmitted privately from at least one audio source to a user.

Independent Claim 51 is directed to a wireless digital audio transmitter 20. With reference to FIG. 2 and paragraph [0009], the transmitter 20 includes a first analog low pass filter 30, a digital low pass filter 34, an analog-to-digital converter 32, a first encoder 36, a second channel encoder 38, a digital modulator 42 and a differential phase shift key (DPSK) module 48. The transmitter 20 transmits a spread spectrum modulated signal such as a direct sequence spread spectrum (DSSS) modulated signal. (See paragraph [0014] of the Parent Application)

The transmitter 20 further includes a code generator 44 that may be used to create a unique user code. The unique user code generated is specifically associated with one wireless digital audio system user, and it is the only code recognized by the receiver 50 operated by a particular user. (See paragraph [0009]) For further noise immunity, a spread spectrum DPSK (differential phase shift key) transmitter or module is utilized.

Independent Claim 52 is directed to a wireless digital audio receiver 50. With reference to FIG. 3 and paragraph [0010], the receiver 50 includes a receiving antenna 52, a bandpass filter 54, a direct conversion receiver or module 56, a demodulator 62, a Viterbi decoder 66, a source decoder 68, a low pass filter 72, and a digital-to-analog converter 70. The spread spectrum modulated signal received by the receiving antenna 52 is processed by the spread spectrum direct conversion receiver or module 56 with a receiver code generator 60. The receiver code generator 60 may contain the same

unique wireless transmission of a signal code word that was transmitted by audio transmitter 20 specific to a particular user. If the unique user code bit sequence is recognized, an audio output representative of music is generated, corresponding to the decoded and converted digital signal. The audio output is wirelessly transmitted to a user for private listening of high fidelity audio music without interference from other users or wireless devices.

Independent Claim 53 also relates to a wireless digital audio receiver 50. Claim 53 contains similar limitations as Claim 52. However, Claim 53 includes an additional limitation directed to a fuzzy logic detector to enhance detection of the unique user code bit sequence. A fuzzy logic detection sub-system 61 is described in paragraphs [0013, 0014, and 0015] and shown in FIG. 1. FIG. 4 is an exemplary graph showing the utilization of an embedded fuzzy logic coding algorithm.

The system 10 further includes a battery-powered audio receiver headphone 50 which receives the CDMA communication signal and audibly reproduces the audio signal representative of music, if the unique user code is recognized, to provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space.

Independent Claim 54 relates to a wireless digital audio system 10 comprising of an audio source 80 which provides a signal representative of music to a battery-powered transmitter 20 which transmits a code division multiple access (CDMA) communication signal, as seen in FIG. 1. The audio source 80 and the transmitter 20 are coupled via an analog headphone jack 82 and plug 22. The CDMA signal

transmitted by the transmitter contains the audio signal representative of music and an added unique user code, as described in paragraph [0009]

Independent Claim 55 also relates to a wireless digital audio system 10. However, in Claim 55, the transmitted CDMA signal has a differential phase shit keying (DPSK) modulated signal as well as an added unique user code for further noise immunity, as described in paragraph [0009].

Independent Claim 57 also relates to a wireless digital audio headset receiver 50. However, in Claim 57, the receiver 50 also includes a direct conversion module 56 configured to receive a wirelessly transmitted code division multiple access (CDMA) signal, the CDMA signal having an audio signal representative of both audio music and a unique user code.

The wireless digital audio headset receiver 50 further includes headset speakers 75 for privately reproducing the audio music to a user that is free of interference from other users of other wireless digital audio music systems in a shared space, if the unique user code is recognized. (See paragraphs [0003] and [0004])

Independent Claim 59 also relates to a wireless digital audio transmitter 20. However, in Claim 59, the wireless digital audio transmitter 20 is configured for CDMA communication. The wireless digital audio transmitter connects to the audio source through an existing headphone jack 82 and plug 22. The transmitter 20 also includes a means for receiving an audio output representative of music from the audio music source 80 which is embodied by a first analog low pass filter 30 receiving the audio output, a digital low pass filter 34, and an analog-to-digital converter (ADC) 32

operatively coupled between the filters 30 and 34 (shown in FIG. 2). The means for generating a unique user code is embodied by a code generator 44 (shown in FIG. 2.) The means for wirelessly transmitting a CDMA communication signal is embodied by a first encoder 36, a second channel encoder 38, a digital modulator 42, a DPSK transmitter 48, and a transmitting antenna 24 (shown in FIG. 2).

The summary above is intended to comply with 37 CFR § 41.37(c) (1) (v) and is not intended to limit the Claims through prosecution history estoppel in any way.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

ISSUE 1:

Whether Claims 30, 53, 56, and 58 are unpatentable under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

ISSUE 2:

Whether Claims 33 and 37 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by Lindemann (U.S. Patent Application Publication 2004/0223622).

ISSUE 3:

Whether Claims 34 and 38 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by Lindemann (U.S. Patent Application Publication 2004/0223622).

ISSUE 4:

Whether Claims 19-29 are unpatentable under 35 U.S.C. § 103(a) over Lindemann (U.S. Patent Application Publication 2004/0223622) in view of Sato (U.S. Patent No. 4,970,637).

ISSUE 5:

Whether Claims 30-32 are unpatentable under 35 U.S.C. § 103(a) over Lindemann (U.S. Patent Application Publication 2004/0223622) in view of Sato (U.S. Patent No. 4,970,637) and in further view of Benthin (U.S. Patent No. 5,790,595).

ISSUE 6:

Whether Claims 41 and 42 are unpatentable under 35 U.S.C. § 103(a) over Lindemann (U.S. Patent Application Publication 2004/0223622).

ISSUE 7:

Whether Claims 43-52 are unpatentable under 35 U.S.C. § 103(a) over Lindemann (U.S. Patent Application Publication 2004/0223622) in view of Sato (U.S. Patent No. 4,970,637).

ISSUE 8:

Whether Claim 53 is unpatentable under 35 U.S.C. § 103(a) over Lindemann (U.S. Patent Application Publication 2004/0223622) in view of Sato (U.S. Patent No. 4,970,637) and in further view of Benthin (U.S. Patent No. 5,790,595).

ISSUE 9:

Whether Claims 54, 55, 57 and 59 are unpatentable under 35 U.S.C. § 103(a) over Lavelle (U. S. Patent No. 6,678,892).

ISSUE 10:

Whether Claims 56 and 58 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Lavelle (U. S. Patent No. 6,678,892) in view of Benthin (U. S. Patent No. 5,790,595).

VII. ARGUMENT

A. Introduction

Each Claim of this patent application is separately patentable and, upon issuance of a patent, will be entitled to a separate presumption of validity under 35 U.S.C. § 282. Hence, each of the Claims 19-34, 37, 38, and 41-59 should be considered individually in light of the arguments against the rejections.

B. Detailed Arguments

1. The rejection of Claims 30, 53, 56 and 58 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement, should be reversed.

The rejection of Claims 30, 53, 56 and 58 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement, should be reversed because all of the elements claimed in Claims 30, 53, 56 and 58 are supported in the originally-filed application.

Independent Claim 30 recites a combination including at least "one audio receiver configured for digital wireless communication ... utilizing embedded fuzzy logic to enhance detection of the unique user code in the transmitted DSSS signal."

Independent Claims 53 and dependent Claims 56, and 58 recite a combination including at least "a fuzzy logic detector to enhance detection of the unique user bit code sequence."

The MPEP provides that the written description requirement of 35 U.S.C. § 112, first paragraph may be satisfied:

> by describing the claimed invention with all of its limitations using such descriptive means as *words*, structures, *figures*, diagrams, and formulas that fully set forth the claimed invention ... [p]ossession may be shown in a variety of ways including ... *the disclosure of drawings*. (Internal citations omitted) (emphasis added). MPEP § 2163.02, 8th Ed. (Rev. 6), September, 2007.

It is clear from the cited section of the MPEP that Appellant can satisfy the written description requirement by having described the claimed invention through "words" or "drawings."

The Final Office Action dated July 23, 2007 ("FOA"), on page 3, states that:

> *Claim 30 recites that the receiver uses embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal. However, Applicant's Fig. 1, shows a fuzzy logic detector (61) inside of the receiver unit (50). Receiver unit 50 is fully disclosed in Fig. 3, however, neither the specification, nor the drawings provide any detail as to how any fuzzy logic is used within the components of Fig. 3 to enhance detection of the unique user code. (Emphasis added)*

First, there are multiple paragraphs directed to fuzzy logic detection embedded in receiver 50. The Appellant directs the board's attention to the entire specification but specifically to paragraphs [0010], [0013] and [0014] for detailed support of the fuzzy logic detection[4]. Fuzzy logic is software that employs a set of rules. For example, in paragraph [0013], the specification states "fuzzy logic detection sub-system 61 may use a set of if-then rules." In paragraph [0014], the specification states:

> "Fuzzy logic detection sub-system 61 in battery powered headphone receiver 50 utilizes the if-then fuzzy set to map the received user code bits into two values: a low (0 or -1) and a high (1). Thus, as the user code bits are received, the "if" rules map the signal bit energy to the fuzzy set low value to some degree and to the fuzzy set high value to some degree. Figure 4 graphically shows that x-value -1 equals the maximum low bit energy representation and x-value 1 equals the maximum high bit energy representation. Due to additive noise, the user code bit

[4] All paragraphs referenced relate to the Instant Application, unless specified otherwise.

> energy may have some membership to low and high as represented in Figure 4. The if-part fuzzy set may determine if each bit in the user code, for every received packet, has a greater membership to a high bit representation or a low bit representation. The more a user code bit energy fits into the high or low representation, the closer its subsethood, i.e., a measure of the membership degree to which a set may be a subset of another set, may be to one."

Paragraph [0014] provides explicit details related to the "rules" and the evaluation of such "rules." More importantly, FIG. 4 is provided to graphically illustrate features of the fuzzy logic detection and the basis of the evaluation of the rules. In fact, FIG. 4 is described as a "graph showing utilization of an embedded fuzzy logic coding algorithm."

The fuzzy logic detection sub-system 61 is shown in FIG. 1 and described as being associated with receiver 50. As acknowledged on page 3 of the FOA, the rejection states "receiver unit 50 is fully disclosed in Fig. 3." Hence, in view of the disclosure and drawings, Appellant has described the fuzzy logic detection sub-system 61 and how it is used to enhance detection of the unique user code.

The Advisory Action dated October 11, 2007 ("Advisory Action"), page 2, states that:

> "... it is unclear whether this "fuzzy logic detector" is a method, software, logic, or hardware device. Furthermore, the specification leads one of ordinary skill in the art to believe that this "detector" is a hardware module of some sort. If it is to be a hardware module, it is not sufficiently shown in Figure 3, more specifically, it is not shown how this module interacts with the rest of the elements in Figure 3 (i.e. where is this detector located with respect to the other block elements?) Further, if it is just to be software, which Examiner does not necessarily interpret from a reading of the specification, which module in Figure 3. performs these operations. Neither of these elements are addressed by the specification and thus the claim cannot be enabled."

First, as the Examiner realizes, multiple methods of implementing a fuzzy logic detector exist. Therefore a person skilled in the art can use any method of

implementation to enable the claim. However, the more important issue is not how the fuzzy logic detector is implemented, but how the fuzzy logic algorithm operates and how the fuzzy logic detector interacts with the other elements, which is unmistakably described in the specification. Second, the algorithm for the fuzzy logic detector was clearly laid out in the specification, as shown above. As the specification demonstrates, the fuzzy logic detector is used in the receiver 50 and a person skilled in the art would recognize that the detector is used somewhere after receiving the signal and before audio output. Additionally, there is no requirement that the fuzzy logic detector be discussed specifically in the drawings so long as the specification makes note of it.

Appellant is unclear as to why the Examiner views "software" as being different from "logic." Nonetheless, "if-then" rules are implemented in software. Many programming languages provide "if-then" syntax. Appellant is also at a loss as to how or why a fuzzy logic detector would be considered "a method."

Appellant notes that a receiver is not just a hardware device such that it functions without any software. On the other hand, a receiver cannot be just software. Software must be executed by a processor having hardware properties. For example, a decoder is implemented using a set of instructions executed by a processor in accordance with various decoding standards or protocols.

In general, a receiver marries hardware components such as a housing, resistors, capacitors, antenna, processors, etc. with software to carryout the receiving functions including, but not limited to, CDMA reception and user code detection. As

disclosed by Appellant, the fuzzy logic detection is used to enhance the detection of a user code by the receiver, especially in a shared space environment with other users.

As to Claims 53, 56 and 58, they include similar claim limitations as Claim 30. Thus, the remarks set forth above in relation to embedded fuzzy logic, as applied to Claim 30, equally apply to Claims 53, 56 and 58.

Appellant therefore respectfully submits that Claims 30, 53, 56 and 58 clearly comply with the provisions of the first paragraph of 35 U.S.C. § 112. Therefore, the improper rejection of Claims 30, 53, 56 and 58 under 35 U.S.C. § 112, first paragraph, should be reversed.

2/3. The rejection of Claims 33, 34, 37 and 38 under 35 U.S.C. § 102(e), as being anticipated by Lindemann, should be reversed.

The rejection of Claims 33, 34, 37 and 38 under 35 U.S.C. § 102(e), as being anticipated by Lindemann, should be reversed because no *prima facie* case of anticipation has been established.

To establish a *prima facie* case of anticipation under 35 U.S.C. § 102(e), a single prior art reference must describe each and every element as set forth in the subject claim. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Also see M.P.E.P. § 2131.

Independent Claims 33 and 34 recite "...at least one module adapted to audibly reproduce said processed CDMA signal, said CDMA communication configuration

providing a user with *independent audio reproduction free of interference from other users or wireless devices.*"

The above emphasized claim language is not taught or suggested by Lindemann. Lindemann relates to a digital wireless loudspeaker system, as specified in the title. Lindemann does not address reproduction that is interference free. Furthermore, Appellant observes that Lindemann does not mention interference or address the problem identified by Appellant and thus Appellant's solution to provide a user with independent audio reproduction free of interference from other users or wireless devices. Instead, Lindemann is directed to a digital wireless loudspeaker system and the delivery of signals to the speakers. Thus, Lindemann is not directed to a system capable of (1) providing a user with independent audio reproduction; and (2) reproduction free of interference from other users or wireless devices. By contrast, Lindemann simply provides a "loudspeaker system" where anyone can listen.

The Examiner asserts on page 4 and 5 of the FOA that

> "Lindemann discloses ... at least one audio transmitter and receiver being configured for code division multiple access (CDMA) communication (para 0075); and at least one module adapted to audibly reproduce said processed CDMA signal, said CDMA communication configuration providing a user with independent audio reproduction *free of interference from other users or wireless devices*. (Fig. 15A; the speakers reproduce, which receive the audio *without interference from the other speakers*)".

The Advisory Action further asserts on page 3 and 4 that "Element (2) is clearly met by virtue of the fact that it is CDMA reproduction. CDMA's entire goal is to minimize interference to provide a clear transmission. ... The fact that the speakers decode status messages to determine whether or not to produce music as well as what to

produce ... clearly meets the 'reproduction free of interference with other users or wireless devices.'"

A quick search of the patent application publication reveals that there is no mention of the term "interference" in Lindemann. It is well known by those skilled in the art that radio frequency (RF) interference originates from a source (i.e., transmitter) external to an RF signal path and produces undesired artifacts in the RF signal. Lindemann does not address speaker receiver interference due to many same transmitters sharing the same space [Lindemann, paragraph 0011 states "...signal generated by the single RF transmitter in the audio transmission device;" and paragraph 0058 states "...Signal generated by the single RF Transmitter."]. Thus, Lindemann does not address a key problem associated with transmitters using the CDMA technology.

It is well known by those skilled in the art that (a) a single transmitter transmits with equal power to multiple receivers; and (b) when multiple CDMA transmitters transmit simultaneously at equal power in a shared space, a receiver will receive more power from the nearest transmitter. Thus, when multiple transmitters are used, the nearest transmitter transmits a signal to a receiver that is of a higher order of magnitude, which is more detectable than a signal from a farther transmitter. Therefore, communications between a receiver and a transmitter, other than the transmitter closest to the receiver, become more difficult, if not impossible. Thus multiple Lindemann systems in proximity will have communication problems, which Lindemann does not address.

Lindemann's system differs from Appellant's invention in that all signals in Lindemann are intended to originate from the same stationary transmitter. As disclosed in paragraph 0013 of Lindemann:

> "When transmitting to several wireless loudspeakers simultaneously, as is the case with stereo or six channel surround sound, the sample rate clocks for the loudspeakers must be accurately synchronized to the data and with each other. Small delays from one speaker to the next would compromise the stereo or surround sound imaging of the sound. Even worse, variable delays would cause sounds to appear to move around in space. This invention solves the audio sample rate synchronization problem by generating the audio sample rate clock directly from the RF receiver symbol rate clock. For an RF system with continuously streaming data transmission, as is the case with digital audio in this invention, this clock is highly accurate and is guaranteed to be synchronized between RF receivers in multiple loudspeakers because it is generated at a single location in the RF transmitter."

In contrast, in Appellant's invention, signals originate from multiple CDMA transmitters. Since the signals originate from multiple CDMA transmitters, it is not feasible to have a common time reference for all the different wireless digital audio system transmissions that arrive at each associated CDMA headphone receivers. Because the transmissions from different CDMA transmitters propagate through different paths, they suffer variable time delays.

In connection with these variable time delays, it is well known by those skilled in the art that a CDMA receiver trying to detect the signal of the ith CDMA transmitter may be much closer in distance (typically resulting in smaller time delay) to, for example, the jth CDMA transmitter than the ith CDMA transmitter. When all transmission powers are equal, the signal from the jth CDMA transmitter will arrive at the CDMA receiver in question with a sufficiently larger power than that of the ith CDMA transmitter, causing incorrect decoding of the ith CDMA transmission.

The Advisory Action asserts that the element (2) (i.e. reproduction free of interference from other users or wireless devices) is clearly met by the virtue of the fact that it is CDMA reproduction. Unfortunately, this is not true. The interference problem lies in the difference in distance from a receiver to its desired transmitter and to the nearby transmitter. Unfortunately, the anti-jamming capacity (or interference avoidance capability) related to CDMA reproduction, as implied by the Advisory Action, is inadequate under most conditions to overcome the disparity seen in near-far signals. Appellant's invention minimizes the described interference, as addressed in detail in paragraphs [0011, 0015 and 0016] of the Parent Application. Therefore, just the mere use of "CDMA reproduction," as asserted on page 3 and 4 of the Advisory Action, does not meet the claim limitation recited in Independent Claims.

Accordingly, Lindemann does not disclose a "CDMA configuration providing a user with independent audio reproduction *free of interference from other users or wireless devices*", particularly when multiple Lindemann systems operate in proximity.

Additionally, dependent Claim 37 depends directly or indirectly from Independent Claim 33. Furthermore, dependent Claim 38 depends from Independent Claim 34. These dependent Claims contain all of the limitations of Independent Claims 33 or 34. Thus, any rejections under 35 U.S.C. §102(e) should be withdrawn by virtue of their dependency from Independent Claims 33 or 34.

Furthermore, Appellant believes that the dependent Claims 37 and 38 recite other features that are clearly lacking from the applied reference(s), and therefore these claims should be allowed.

At least because Lindemann does not disclose all of the recitations of Claims 33 and 34, a *prima facie* case of anticipation has not been established under 35 U.S.C. § 102(e). Therefore, the improper rejection of Claims 33, 34, 37 and 38 under 35 U.S.C. § 102(e) should be reversed.

4. The rejection of Claims 19-29 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann in view of Sato, should be reversed.

The rejection of Claims 19-29 under 35 U.S.C. § 103(a) as being unpatentable over Lindemann in view of Sato, should be reversed because no *prima facie* case of obviousness has been established.

The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. MPEP § 2142. To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, two basic criteria must be met. First, the prior art references (or references when combined) must teach or suggest all the claim limitations. Second, there is evidence that the combination of prior art references would yield a predictable result to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.,* 127 S.Ct. 1727 (2007). Rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusions of obviousness. *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

In determining the scope and content of the prior art, Office personnel must first obtain a thorough understanding of the invention disclosed and claimed in the application under examination by reading the specification, including the claims, to understand what the applicant has invented. See MPEP § 904 (8th edition, revision 5,

August 2006). The scope of the claimed invention must be clearly determined by giving the claims the "broadest reasonable interpretation consistent with the specification." See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) and MPEP § 2111. Ascertaining the differences between the claimed invention and the prior art requires interpreting the claim language and considering both the invention and the prior art as a whole. See MPEP §§ 2111, 2141.02.

As shown below, the examiner has not met his burden in establishing a *prima facie* case of obviousness.

Independent Claim 19 recites

> "...at least one module adapted to reproduce said audio output representative of said music, if the unique user bit code sequence is recognized, said audio output having been wirelessly transmitted from said at least one audio source to a user for private audio reproduction of said music without interference from other users or wireless devices."

In addition to Lindemann and Sato (U.S. Patent No. 4,970,637), the rejection of Claim 19 also relies upon Roberts, *et al.* (U.S. Patent 6,418,558), and Schotz (U.S. Patent 5,946,343). Furthermore, the rejection of Claim 19 relies on numerous statements that various claimed elements in Claim 19 are notorious.

In regards to Claim 19, in addition to the remarks set forth above in relation to Claims 33 and 34, neither Lindemann nor Sato teach "for private audio reproduction of said music" or "reproduce said audio output representative of said music, if the unique user code bit sequence is recognized." Hence any combination of Lindemann and Sato would not produce Appellant's invention. There is nothing in Lindemann, the primary reference, to provide a user with private audio reproduction, such as via headphones,

and without interference from other users or wireless devices. By contrast, Lindemann simply provides a "loudspeaker system" where anyone can listen; Lindemann does not address interference anywhere. The word "private" does not appear anywhere in Lindemann or Sato. Furthermore, "private" does not appear in Schotz '343 or Roberts '558.

Page 5 of the Advisory Action asserts that the purpose of Lindemann is to provide music to multiple zones. Appellant's invention, on the other hand, among other things, provides private listening of different music to multiple individuals sharing the same space (i.e. room/zone). Paragraph [0004] states:

> "There is a need for a battery powered simple connection system for existing music player devices (i.e., the previously mentioned music devices), to allow coded digital wireless transmission (using a battery powered transmitter) to a headphone receiver (using battery powered receiver headphones) that accomplishes private listening to multiple users occupying the same space without the use of wires."

Music devices enumerated in paragraph [0002] includes portable devices. Therefore, Lindemann does not disclose Appellant's system that provides different music privately to multiple individuals, where each user has her own receiver headphone and transmitter and is in the same shared space with other users.

Additionally, in Lindemann, the system does not transmit "music" with a "unique user code bit sequence." At best, Lindemann sends different channels (for stereo or surround sound) to different speakers and does not require "a unique user code bit sequence." Providing a "loudspeaker system" is at the heart of the Lindemann invention. By contrast Appellant's invention seeks to provide "private audio

reproduction." *"Private audio reproduction" is diametrically opposed to the operation of a "loudspeaker" system such as that of Lindemann.*

Appellant's wireless digital audio music system utilizes Code Division Multiple Access (CDMA) to allow multiple wireless digital audio music system users to simultaneously share a finite amount of radio frequency spectrum. Lindemann utilizes CDMA to multiplex the audio spectrum (Lindemann, paragraph 0075 states "This corresponds to a Code Division Multiple Access (CDMA) method of multiplexing the multiple audio channels."). Moreover, Schotz does not mention CDMA anywhere. Therefore, any combination of Lindemann, Sato, Schotz or Roberts would not produce the Appellant's invention.

On page 8 of the FOA, the Examiner appears to be equating "unique user code bit sequence," as claimed by Appellant, to "status messages ... in the transmission frames to control speaker attributes such as speaker group." The FOA also directs Appellant to paragraphs [0011] and [0064]. However, Lindemann provides channel selection for various combinations of speakers or groups of speakers such as to provide, in one embodiment, a "full complement of six surround sound speakers." Lindemann is essentially silent on the use of or the need for a "unique user code bit sequence."

On page 4 of the Advisory Action asserts that:

> "Regarding (2) the status messages are equated to the unique user code as stated by Applicant. To further clarify, para [0065] explicitly states that 'the status information contains commands to enable or disable a particular group of speakers.' Thus, if the status message enables a speaker (i.e. if the unique user code bit sequence is recognized [in this case if the enable command is

recognized]) the speaker reproduces music (i.e. reproduce said audio output representative of said music)."

However, the status message enables an individual speaker to select a particular channel from a set of channels contained in a single RF signal transmitted from a particular RF transmitter. (Lindemann, Claim 1 states "means for selecting *one* of the audio channels *from the* RF signal for broadcast" (emphasis added); Lindemann Claim 14 states "transmitting *an* RF signal *including at least two audio channels* of transmission data." (emphasis added)). Lindemann does not disclose the use of unique user codes to select between *multiple* RF signals. As discussed above, Lindemann does not discuss the problem of interference caused by multiple CDMA transmission sources in proximity of a CDMA receiver, and therefore does not discuss utilization and capture of unique user codes to select between multiple RF signals.

Dependent Claims 20-29 depend directly or indirectly from independent Claim 19. These dependent Claims contain all of the limitations of independent Claim 19, thus, any rejections under 35 U.S.C. § 103 should be withdrawn by virtue of their dependency from independent Claim 19.

Additionally, the Appellant believes that many of the dependent Claims 20-29 recite other features that are clearly lacking from the applied references, and therefore requests the Board to overturn these rejections.

As to Claim 28, Lindemann is directed to a "digital wireless loudspeaker system" with surround sound capability. Thus, modifying Lindemann to incorporate the teachings of Lindemann as modified by Sato (Schotz and/or Roberts) into a headphone set is basically using Appellant's own disclosure. Furthermore, such a modification

destroys the heart of Lindemann's invention (primary reference) and its intended operation, which is to disperse multiple speakers with speaker groups in different rooms as well as provide a "full complement of six surround sound speakers."

Accordingly, neither Lindemann nor Sato teach or suggest, alone or in combination, "private audio reproduction of said music" or "reproduce said audio output representative of said music, if the unique user code bit sequence is recognized," as recited in Claim 19. At least because neither Lindemann nor Sato, alone or in combination, teach or suggest all of the recitations of Claim 19, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, Appellant respectfully requests the Board to reverse the improper rejection of Claims 19-29 under 35 U.S.C. § 103(a).

5. The rejection of Claims 30-32 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann in view of Sato and in further view of Benthin, should be reversed.

The rejection of Claims 30-32 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann in view of Sato, should be reversed because no *prima facie* case of obviousness has been established.

As shown below, the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The case law and the MPEP requirements relating to obviousness are described above under the arguments relating to Issue 4 of this Appeal Brief.

Independent Claim 30 recites

> "...at least one audio receiver configured for digital wireless communication with said at least one audio transmitter and using embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal ..."

Claim 30 includes similar Claim limitations as Claim 19. Thus, the remarks set forth above in relation to Lindemann, Sato and the combination of Lindemann and Sato, as applied to Claim 19 equally apply to Claim 30. Claim 30 includes additional limitations such as "using embedded fuzzy logic."

On Page 14, lines 8-10 of the FOA, the Examiner acknowledges that Lindemann, as modified by Sato, does not "disclose that the receiver utilizes embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal." Thus, the rejection relies on Benthin. However, Benthin does not teach "*fuzzy logic to enhance detection of the unique user code*."

In Appellant's invention, embedded fuzzy logic to enhance detection of the unique user code is useful. Lindemann does not require a unique user code. Since Lindemann does not require a unique user code, there is no need to use "embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal". (FOA page 14, lines 15-17) Therefore, it would not be obvious, to one of ordinary skill in the art at the time the invention was made, to implement the soft decision components of Benthin for Lindemann in view of Sato.

Dependent Claims 31 and 32 depend directly or indirectly from Independent Claim 30. These dependent Claims contain all of the limitations of Independent Claim 30. Thus, any rejections under 35 U.S.C. § 103 should be reversed by virtue of their dependency from Independent Claim 30.

Appellant further believes that the dependent Claims 31-32 recite other features that are clearly lacking in the applied references, which is another ground for reversing these rejections.

As to Claim 32, Lindemann is directed to a "digital wireless loudspeaker system" with surround sound capability. Thus, modifying Lindemann to incorporate the teachings of Lindemann, as modified by Sato (Schotz and/or Roberts), into a headphone set is using Appellant's own disclosure. Furthermore, such a modification destroys the heart of Lindemann's invention (primary reference) and its intended operation, which is to disperse multiple speakers with speaker groups in different rooms as well as provide a "full complement of six surround sound speakers."

Accordingly, neither Lindemann, Sato nor Benthin teach or suggest, alone or in combination, "... at least one audio transmitter using embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal ...", as recited in Claim 30. At least because neither Lindemann, Sato, nor Benthin, alone or in combination, teach or suggest all of the recitations of Claim 30, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, the improper rejection of Claims 30-32 under 35 U.S.C. § 103(a) should be reversed.

6. The rejection of Claims 41 and 42 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann, should be reversed.

The rejection of Claims 41 and 42 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann, should be reversed because no *prima facie* case of obviousness has been established.

As shown below, the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The case law and the MPEP requirements relating to obviousness are described above under the arguments relating to Issue 4 of this Appeal Brief.

Dependent Claims 41 and 42 depend directly or indirectly from Independent Claims 33 and 34. These dependent Claims contain all of the limitations of Independent Claims 33 and 34. Therefore, any rejections under 35 U.S.C. §103 should be withdrawn by virtue of their dependency from Independent Claims 33 and 34.

Lindemann, as modified by the Examiner, does not teach the deficiencies described in relation to Independent Claims 33 and 34. Hence, Lindemann, as modified, does not teach the claimed invention since Lindemann, as modified, does not teach all the limitations of the base Claims (33 and 34) from which Claims 41 and 42 depend.

Additionally, there is no suggestion to make the transmitter of Lindemann "battery-powered," as claimed in Claims 41 and 42.

In view of the above remarks, the rejection of Claims 41 and 42 under 35 U.S.C. § 103(a) as being unpatentable by Lindemann should be reversed.

Accordingly, Lindemann does not teach or suggest the claimed invention as recited in Claims 41 and 42. At least because Lindemann does not teach or suggest all of the recitations of Claims 41 and 42, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, the improper rejection of Claims 41 and 42 under 35 U.S.C. § 103(a) should be reversed.

7. The rejection of Claims 43-52 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann in view of Sato, should be reversed.

The rejection of Claims 43-52 under 35 U.S.C. § 103(a) as being unpatentable over Lindemann in view of Sato should be reversed because no *prima facie* case of obviousness has been established.

As shown below, the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The case law and the MPEP requirements relating to obviousness are described above under the arguments relating to Issue 4 of this Appeal Brief.

Independent Claims 43 and 44 contain similar language as Claim 19. Thus, the remarks set forth above in relation to Claim 19 equally apply to Claims 43 and 44.

Dependent Claims 45, 47, and 49 depend directly or indirectly from Independent Claim 43. Dependent Claims 46, 48, and 50 depend directly or indirectly from Independent Claim 44. These dependent Claims contain all of the limitations of their corresponding Independent Claim 43 or 44. Therefore, any rejections under 35 U.S.C. §103 should be withdrawn by virtue of their dependency thereof.

Appellant further believes that many of the dependent Claims 45-50 recite other features that are clearly lacking in the applied references, and therefore requests the Board to overturn these rejections.

Claim 51 positively recites "a code generator to add a unique user code to a modulator output, the modulator output including the audio output representative of said music." As remarked previously, Lindemann, the primary reference, neither requires a "unique user code" nor adds "the unique user code to a modulator output ... including

the audio output representative of said music." Hence, Lindemann does not have a "code generator to add a unique user code."

Moreover, neither Lindemann, nor Sato, adds "the unique user code to a modulator output ... including the audio output representative of said music." Hence any combination of these references still would not produce Appellant's claimed invention.

Claim 52 includes a positive recitation of a "unique user code bit sequence" and "for private listening of high fidelity audio music." The remarks set forth above in relation to Claim 19 equally apply to Claim 52. As previously mentioned, the heart of Lindemann's invention is a "loudspeaker system." The operations of a "loudspeaker system" are diametrically opposed to Appellant's invention to provide "private listening of ... music."

On page 13 of the FOA, Appellant observes that when rejecting Claims 43, 44 and 49-52, the Examiner relies on the rejections provided for 19, 27 and 30. However, Claim 30 is not rejected under Lindemann in view of Sato (Schotz and/or Roberts).

Nonetheless, neither Lindemann, nor Sato teach or suggest, alone or in combination, the claimed invention as recited in Claims 43-52. At least because neither Lindemann, Sato nor Benthin, alone or in combination, teach or suggest all of the recitations of Claims 43-52, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, the improper rejection of Claims 43-52 under 35 U.S.C. § 103(a) should be reversed.

8. The rejection of Claim 53 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann in view of Sato and in further view of Benthin, should be reversed.

The rejection of Claim 53 under 35 U.S.C. § 103(a), as being unpatentable over Lindemann in view of Sato and in further view of Benthin, should be reversed because no *prima facie* case of obviousness has been established.

As shown below, the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The case law and the MPEP requirements relating to obviousness are described above under the arguments relating to Issue 4 of this Appeal Brief.

Claim 53 includes a positive recitation of a "unique user code bit sequence" and "a fuzzy logic detector to enhance detection of the unique user code bit sequence." The remarks set forth above in relation to Claim 30 equally apply to Claim 53.

As mentioned previously, Lindemann does not require a unique user code. In Appellant's invention, a fuzzy logic detector to enhance detection of the unique user code is useful. By contrast, since Lindemann does not require a unique user code, "a fuzzy logic detector to enhance detection of the unique user code" would not be useful. Additionally, arguments related to Benthin, as discussed above, are also applicable here.

Accordingly, neither Lindemann, Sato nor Benthin teach or suggest, alone or in combination, "unique user code bit sequence" and "a fuzzy logic detector to enhance detection of the unique user code bit sequence" as recited in Claim 53. At least because neither Lindemann, Sato nor Benthin, alone or in combination, teach or

suggest all of the recitations of Claim 53, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, the improper rejection of Claim 53 under 35 U.S.C. § 103(a) should be reversed.

9. The rejection of Claims 54, 55, 57 and 59 under 35 U.S.C. § 103(a), as being unpatentable over Lavelle, should be reversed.

The rejection of Claims 54, 55, 57 and 59 under 35 U.S.C. § 103(a), as being unpatentable over Lavelle (U.S. Patent No. 6,678,892), should be reversed because no *prima facie* case of obviousness has been established.

As shown below, the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The case law and the MPEP requirements relating to obviousness are described above under the arguments relating to Issue 4 of this Appeal Brief.

Claim 54 recites

> "...an audio source to provide an audio signal representative of music having an existing analog headphone plug; a battery-powered transmitter coupled to ... via said analog headphone plug ..."

The FOA relies on the wireless transmitter 510 in FIG. 1B for the battery powered transmitter of Appellant's Claim. The Examiner acknowledges in the FOA that Lavelle does not include headphone plugs. However, the Examiner states that "headphone plugs are notoriously well known in the art." The Examiner provides Appellant with an example of an iPod.

First, in Appellant's Claim, the connection of the audio source and the transmitter via a headphone plug/jack is positively recited. Appellant observes that the transmitter and receiver of Lavelle are intended to be installed in a vehicle and would generally be

permanent fixtures in the vehicle. The transmitter 510 in Lavelle, is arranged to communicate with wireless headphone sets via CDMA. Hence, in Lavelle, there is neither an existing analog headphone plug/jack, as claimed, nor a need for one. More importantly, Lavelle has no need for a headphone plug/jack since the original configuration of the primary reference (i.e. Lavelle) seeks to provide wireless communications in a vehicle (obviating the need for a headphone plug/jack to connect the headphone).

Nonetheless, even assuming that Lavelle may be modified with a headphone plug/jack, there is no teaching in Lavelle to further remove the transmitter 510 from the vehicle and couple this "transmitter" via a headphone plug/jack (which is not even present in Lavelle). Nowhere in Lavelle is such an arrangement described, especially since a headphone plug/jack does not exist in the first place. Hence, it appears that the Examiner is rejecting Appellant's invention in hindsight, using Appellant's own disclosure.

Appellant further observes that the transmitter 510 of Lavelle is battery powered by virtue of its installation in the vehicle and connection to the vehicle's battery source. Thus, for Lavelle's transmitter to utilize the charging (battery) system of a vehicle for power, it is necessary to connect the entertainment unit and transmitter by cable or cord to the charging (battery) system. Hence, removing the transmitter 510 from the vehicle's battery source destroys the transmitter's ability to use the vehicle's battery source relied upon in the Examiner's rejection on page 17 of the FOA.

Additionally, Lavelle uses a vehicle battery as a power source. Please note that vehicle batteries operate at significantly different voltages and amperage compared to the type of battery used in a portable music system. A typical vehicle battery operates at roughly 12.6 volts to 14.4 volts, while a battery in a portable music player typically operates at 3.7 volts to 6 volts. Furthermore, a vehicle battery is designed to output a fairly large amount of cranking amps, typically 400 to 1000 amps, upon startup to start the engine and cannot sustain its amperage level for more than a short period of time, typically 30 seconds. After the massive amperage provided at startup, the battery recedes to an output level that typically varies from 200 to 500 amps. On the other hand, a battery in a wireless music player is typically designed to constantly output several hundred *milli*-amps. Thus, Lavelle systems are designed to use a completely different battery type with completely a different function as compared to Appellant's portable music player battery. Moreover, and fairly obviously, vehicle batteries are designed for massive power drain, and thus are fairly bulky and heavy, with weight typically in the tens of pounds. Portable music player batteries are obviously designed to be portable, and thus are light and compact, with weight typically under a pound. Lavelle does not contemplate using a portable battery type, and thus Lavelle does not disclose the use of a portable battery-powered transmitter for use in a portable system.

Additionally, while Lavelle employs CDMA communications between the transmitter and headphone, Lavelle does not teach a unique user code, as claimed. In the CDMA embodiment of Lavelle, Walsh code generators and PN (pseudo random

number) generators are described. However, while these generators produce a code, such a code is designed to change. Thus, Lavelle codes are not "unique" user codes.

Appellant observes that Lavelle provides multiple headphone sets in a vehicle and intends to minimize interference between the headphone sets [Lavelle 6,678,892 column 6 lines 43 – 45 "...the wireless signals may be encoded to prevent interference between the two wireless headphone sets 152, 154."]. By contrast, Claim 54 recites "... CDMA communication ...provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space." Each wireless digital audio music system consists of a CDMA transmitter and a CDMA receiver headphone; hence, interference between a particular CDMA receiver headphone of a wireless digital audio music system and the CDMA transmitters of other wireless digital audio music systems, in a shared space, is eliminated.

Lavelle's CDMA embodiment does not address interference between a headphone set and many transmitters simultaneously sharing the same space. Additionally, Lavelle also does not "provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space," as claimed. Furthermore, Lavelle does not use a unique user code.

Page 7 of the Advisory Action asserts that:

> "The specific carrier frequency enables the device to tune to a particular program. This is equated with the unique user code. If this was not unique to each headphone device, there would be nothing to prevent interference or allow selection as shown in col. 7."

However, with regards to CDMA transmissions, Lavelle states "... the use of CDMA technology enables a single transmitter (i.e. wireless transmitter 510) to transmit all programs simultaneously, with a user being able to select the program he or she intends to hear via a selector ...". Lavelle further states "... the plurality of audio programs are then combined, superimposed onto *a* carrier frequency, and transmitted by the wireless transmitter 510 ..." (emphasis added). Appellant's invention uses multiple transmitters, where each transmitter outputs data packets in a stream. These data packets contain unique user codes to allow a receiver to determine whether or not to process a particular data packet stream. The unique user codes allow a receiver to pick and choose one of several data packet streams, instead of selecting just a particular program within a particular data packet stream. The unique user codes in Appellant's invention aid in allowing CDMA transmitters to operate in proximity to a CDMA receiver, as discussed above.

In Appellant's invention, both the transmitter and receiver of the wireless digital audio music system are battery-powered for use that includes portable audio sources so the wireless digital audio music system is without cable or cord to limit the mobility of a user operating a portable music player. Because the user is mobile, two or more wireless digital audio music systems may be in use at the same time in a shared space. In this event, a particular wireless digital audio music system (containing a transmitter and receiver) does not interfere with any other wireless digital audio music system (containing another transmitter and receiver) in a shared space.

As stated previously by Appellant, in the June 11, 2007 Response "It is well known by those skilled in the art that radio frequency (RF) interference originates from a source (i.e. transmitter) external to a RF signal path and produces undesired artifacts in the RF signal." Lavelle's CDMA system contains only one transmitter (Lavelle column 7 lines 26 – 28 states "It is to be appreciated that the use of CDMA technology enables a single transmitter (i.e., wireless transmitter 510) to transmit all programs simultaneously"). Because Lavelle's CDMA embodied system contains only one transmitter, it does not address headphone receiver interference due to many same transmitters simultaneously sharing the same space.

Appellant notes that a basic communication system consists of a transmitter, the channel and a receiver. The channel represents the propagating media or the electromagnetic path interconnecting the transmitter and the receiver. It is from this transmission channel that various anomalies and interference effects enter the system operation. Thus, although the design and fabrication of the transmitter and receiver portions are, for the most part, entirely in the hands of the communication engineer, it is often the properties of the channel that ultimately influence and dictate such procedures; knowledge of these channel properties is mandatory for successful engineering.

Lavelle's system differs from Appellant's invention because all signals in Lavelle originate from a single stationary transmitter. Lavelle at Column 7 lines 26 – 30 recites:

> "It is to be appreciated that the use of CDMA technology enables a single transmitter (i.e., wireless transmitter 510) to transmit all programs simultaneously"

The Advisory Action on page 7 asserts that Lavelle ". . . provides a user (i.e. one of the listeners of the headphones) with private audio reproduction (i.e. by virtue of the nature of headphones) free from interference from other users (i.e. headphones 152 and 154 have the interference minimized utilizing CDMA technology col. 7) in a shared space (i.e. interior of an automobile)." The Advisory Action misconstrues Appellant's invention. As stated earlier, Lavelle only utilizes a single transmitter. Therefore, Lavelle does not deal with interference that could result from multiple transmitters and multiple receivers, whereby each transmitter transmits to each respective receiver in a shared space. Additionally, the arguments advanced by Appellant under Issues 2/3 relating to CDMA reproduction interference are equally applicable here.

Lavelle never mentions or suggests that his CDMA design accounts for multiple similar CDMA transmitters operating in the same space. Hence, because this channel condition is not considered in Lavelle's design, Lavelle could not possibly teach a solution – namely, Appellant's solution where "Other code words from wireless digital audio systems 10 may appear as noise to a particular audio receiver 50." (Parent Application paragraph [0016]); "...utilizing timing and synchronization to capture the correct bit sequence embedded in the received spread spectrum signal." (Parent Application, paragraph [0015]); and "transmit an electromagnetic signal ... using approximately 100 milliwatts or less of power." (paragraph [0011] of the Parent Application).

Claims 55 and 59 contains similar language as Claim 54. Thus, the remarks above in relation to Claim 54 equally apply to Claims 55 and 59.

As to Claim 57, Lavelle or Lavelle, as modified, does not teach a "unique user code" and "free of interference from other users of other wireless digital audio music systems in a shared space." Previous arguments in this Appeal Brief relating to unique user code equally apply to Claims 57 and 59.

Accordingly, Lavelle does not teach or suggest "...an audio source to provide an audio signal representative of music having an existing analog headphone plug; a battery-powered transmitter coupled to ... via said analog headphone plug ..." as recited in Claims 54 and 55. Additionally, as discussed above, Lavelle also does not teach or suggest the limitations of Claims 57 and 59.

At least because Lavelle does not teach or suggest all of the recitations of Claims 54, 55, 57, and 59, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, the improper rejection of Claims 54, 55, 57, and 59 under 35 U.S.C. § 103(a) should be reversed.

10. The rejection of Claims 56 and 58 under 35 U.S.C. § 103(a), as being unpatentable over Lavelle in view of Benthin, should be reversed.

The rejection of Claims 56 and 58 under 35 U.S.C. § 103(a) as being unpatentable over Lavelle in view of Benthin, should be reversed because no *prima facie* case of obviousness has been established.

As shown below, the Examiner has not met his burden in establishing a *prima facie* case of obviousness. The case law and the MPEP requirements relating to obviousness are described above under the arguments relating to Issue 4 of this Appeal Brief.

Claim 56, by virtue of its dependency, contains all of the limitations of Independent Claim 55, and therefore allowable. Additionally, it recites features that are clearly lacking from Lavelle. Lavelle does not teach a "unique user code." Thus, there is no motivation to modify Lavelle with a fuzzy logic detector to enhance the detection of the "unique user code."

Claim 58, by virtue of its dependency, contains all of the limitations of Independent Claim 57, and therefore allowable. Additionally, it recites features that are clearly lacking from Lavelle. Lavelle does not teach a "unique user code." Thus, there is no motivation to modify Lavelle with a fuzzy logic detector to enhance the detection of the "unique user code."

Additionally, arguments related to Benthin, as discussed above, are also applicable here.

Accordingly, Lavelle alone or in view of Benthin does not teach or suggest a "unique user code," as recited in Claims 56 and 58. At least because Lavelle alone or in view of Benthin does not teach or suggest all of the recitations of Claims 56 and 58, a *prima facie* case of obviousness under 35 U.S.C. § 103(a) has not been established. Therefore, the improper rejection of Claims 56 and 58 under 35 U.S.C. § 103(a) should be reversed.

C. Conclusion

For the foregoing reasons, Appellant respectfully requests the Honorable Board to reverse the Examiner's rejections and allow the pending Claims 19-34, 37, 38, and 41-59.

To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this Appeal Brief, Appellant hereby respectfully requests such extension. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 that are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, the Commissioner is hereby authorized to charge such fees to our Deposit Account No. 50-4010.

Respectfully submitted,
THE PATEL LAW FIRM, P.C.

Natu J. Patel
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VIII. CLAIMS APPENDIX

Claims Appendix to Appeal Brief Under Rule 41.37(c)(1)(viii)

19. A wireless digital audio system, comprising:

at least one audio source to produce an audio output representative of music;

at least one digital audio transmitter operatively coupled to said at least one audio source, said at least one audio transmitter comprising:

a first analog low pass filter receiving the audio output from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code bit sequence and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal having said audio output representative of the music and the unique user code bit sequence;

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter, said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the unique user code bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process an output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating the audio output representative of the music; and

at least one module adapted to reproduce said audio output representative of said music, if the unique user code bit sequence is recognized, said audio output having been wirelessly transmitted from said at least one audio source to a user for private audio reproduction of said music without interference from other users or wireless devices.

20. The wireless digital audio system of Claim 19, wherein said BPF is a wideband BPF.

21. The wireless digital audio system of Claim 19, wherein said modulator is a 64-Ary modulator.

22. The wireless digital audio system of Claim 19, wherein said demodulator is a 64-Ary demodulator.

23. The wireless digital audio system of Claim 19, wherein said generated audio output is in the approximate range of 20 Hz to 20 kHz.

24. The wireless digital audio system of Claim 19, wherein said spread spectrum signal is transmitted at about 2.4 GHz via an omni-directional antenna.

25. The wireless digital audio system of Claim 24, wherein said spread

spectrum signal is transmitted at a power of about 100 milliwatts or less.

26. The wireless digital audio system of Claim 19, wherein said ADC is a 4-bit analog-to-digital converter.

27. The wireless digital audio system of Claim 19, wherein said at least one audio source is a portable audio player.

28. The wireless digital audio system of Claim 19, wherein said at least one audio reproducing module includes at least one headphone speaker.

29. The wireless digital audio system of Claim 19, wherein said BPF is operatively coupled to at least one antenna configured to receive said transmitted DSSS signal.

30. A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source, said at least one audio transmitter comprising:

a first analog low pass filter receiving audio output from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital

modulator and a unique user code and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter and utilizing embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal, said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the correct bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating the audio output;

at least one module adapted to amplify said generated audio output; and

at least one module adapted to reproduce said amplified audio output, if the unique user code is recognized, said audio output having been wirelessly transmitted from said at least one audio source to a user privately without interference from other users or wireless devices.

31. The wireless digital audio system of Claim 30, wherein said at least one audio amplifying module includes at least one power amplifier, said at least one power amplifier being configured to provide a low distortion audio signal output.

32. The wireless digital audio system of Claim 31, wherein said at least one audio reproducing module includes at least one headphone speaker, said at least one headphone speaker receiving said low distortion audio signal output from said at least one power amplifier.

33. A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source;

at least one audio receiver adapted for digital wireless communication with said at least one audio transmitter, each of said at least one digital audio transmitter and receiver being configured for code division multiple access (CDMA) communication; and

at least one module adapted to audibly reproduce said processed CDMA signal, said CDMA communication configuration providing a user with independent audio reproduction free of interference from other users or wireless devices.

34. A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source;

at least one audio receiver adapted for digital wireless communication with said at least one audio transmitter, each of said at least one digital audio transmitter and receiver being configured for code division multiple access (CDMA) communication;

at least one module adapted to amplify said processed CDMA signal; and

at least one module adapted to audibly reproduce said amplified signal, said CDMA communication configuration providing a user with independent audio reproduction free of interference from other users or wireless devices.

37. The wireless digital audio system of Claim 33, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

38. The wireless digital audio system of Claim 34, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

41. The wireless digital audio system of Claim 33, wherein at least one of said digital audio transmitter and receiver is battery-powered.

42. The wireless digital audio system of Claim 34, wherein at least one of said digital audio transmitter and receiver is battery-powered.

43. A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source, said at least one audio transmitter comprising:

a first analog low pass filter receiving audio output representative of music from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code bit sequence and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter, said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the the unique user code bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating the audio output representative of said music; and

at least one module adapted to reproduce said audio output, if the unique user code bit sequence is recognized, said audio output representative of said music having been wirelessly transmitted from said at least one audio source to a user privately without interference from other users or wireless devices.

44. A wireless digital audio system, comprising:

at least one audio source;

at least one digital audio transmitter operatively coupled to said at least one audio source, said at least one audio transmitter comprising:

a first analog low pass filter receiving audio output representative of music from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder; and

a differential phase shift key (DPSK) module receiving output from said digital modulator and a unique user code and being configured for direct sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal;

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter, said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture the unique user code embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating the audio output representative of the music;

at least one module adapted to amplify said generated audio output; and

at least one module adapted to reproduce said amplified audio output, if the unique user code is recognized, said audio output having been wirelessly transmitted from said at least one audio source to a user privately.

45. The wireless digital audio system of Claim 43, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

46. The wireless digital audio system of Claim 44, wherein said at least one audio source provides analog output in the approximate range of 20 Hz to 20 kHz.

47. The wireless digital audio system of Claim 43, wherein at least one of said digital audio transmitter and receiver is battery-powered.

48. The wireless digital audio system of Claim 44, wherein at least one of said digital audio transmitter and receiver is battery-powered.

49. The wireless digital audio system of Claim 43, wherein said at least one audio source is a portable music player.

50. The wireless digital audio system of Claim 44, wherein said at least one audio source is a portable music player.

51. A wireless digital audio transmitter, comprising:

a first analog low pass filter receiving audio output representative of music from at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters;

a first encoder receiving output from said digital low pass filter and being configured to reduce intersymbol interference (ISI);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors;

a digital modulator operatively coupled to said second channel encoder;

a code generator to add a unique user code to a modulator output, the modulator output including the audio output representative of said music; and

a differential phase shift key (DPSK) module receiving the modulator output from said digital modulator and the unique user code and being configured for direct

sequence spread spectrum (DSSS) communication, said DPSK module transmitting a corresponding DSSS signal.

52. A wireless digital audio receiver, comprising:

a band pass filter (BPF) configured to process a transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture a unique user code bit sequence embedded in said processed DSSS signal;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder receiving said digital output from said Viterbi decoder and being configured to decode the digital signal encoded therein;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output representative of music, if the unique user code bit sequence is recognized, corresponding to the decoded and converted digital signal, said audio output having been wirelessly transmitted to a user for private listening of high fidelity audio music without interference from other users or wireless devices.

53. A wireless digital audio receiver, comprising:

a band pass filter (BPF) configured to process a transmitted DSSS signal;

a direct conversion module receiving output from said BPF and being configured to capture a unique user code bit sequence embedded in said processed DSSS signal;

a fuzzy logic detector to enhance detection of the unique user code bit sequence;

a digital demodulator adapted to process output from said direct conversion module;

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output;

a source decoder receiving said digital output from said Viterbi decoder and being configured to decode the digital signal encoded therein;

a second analog low pass filter; and

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter, said second analog low pass filter generating an audio output, if the unique user code bit sequence is recognized, corresponding to the decoded and converted digital signal, said audio output having been wirelessly transmitted to a user privately without interference from other users or wireless devices.

54. A wireless digital audio system, comprising:

an audio source to provide an audio signal representative of music having an existing analog headphone plug;

a battery-powered transmitter coupled to said at least one audio source via said analog headphone plug and operative to transmit a code division multiple access (CDMA) communication signal having said audio signal representative of said music and an added unique user code;

a battery-powered audio receiver headphone set operative to receive the CDMA communication signal and audibly reproduce said audio signal representative of said music, if the unique user code is recognized, to provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space.

55. A wireless digital audio system, comprising:

an audio source to provide an audio signal representative of music having an existing analog headphone plug;

a battery-powered transmitter coupled to said at least one audio source via said analog headphone plug and operative to transmit a code division multiple access (CDMA) communication signal having a differential phase shift keying (DPSK) modulated signal of said audio signal representative of said music and an added unique

user code;

an audio receiver headphone set operative to receive the CDMA communication signal and audibly reproduce said audio signal, if the unique user code is recognized, to provide a user with private audio reproduction of said music free of interference from other users of other wireless digital audio music systems in a shared space.

56. The system of Claim 55, said audio receiver headphone further comprising a fuzzy logic detector to enhance detection of the unique user code.

57. A wireless digital audio headset receiver, comprising:

a direct conversion module configured to receive a wirelessly transmitted code division multiple access (CDMA) signal having an audio signal representative of audio music and a unique user code; and

headset speakers for privately reproducing said audio music to a user, if the unique user code is recognized, and free of interference from other users of other wireless digital audio music systems in a shared space.

58. The receiver of Claim 57, further comprising a fuzzy logic detector to enhance detection of the unique user code.

59. A code division multiple access (CDMA) battery-powered transmitter comprising:

a jack to connect to an existing analog headphone plug of an audio source;

means for receiving an audio output representative of music from the audio music source;

means for generating a unique user code; and

means for wirelessly transmitting a CDMA communication signal having said audio output representative of said music and said unique user code to a wireless headphone receiver.

IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE